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Personalizing the tourist offer with the AI applications of “Unexpected Italy”

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Abstract. In recent years, the intersection of tourism and artificial intelligence (AI) has opened new frontiers for innovation in travel experiences, customer engagement and destination management, particularly regarding the overtourism problem. In Italy, where cultural and environmental heritage faces increasing pressure from overtourism, innovative approaches are crucial to ensure sustainable development. This paper explores the role of AI in fostering more balanced tourism, with a focus on the case of “Unexpected Italy”, a pioneering start-up that leverages AI to promote lesser-known destinations and off-the-beaten path experiences. Through personalized recommendations, predictive analytics, and data driven storytelling, Unexpected Italy aims to redistribute tourist flows, support local economies, and preserve the authenticity of Italy's diverse territories. The study highlights how AI powered solution can serve as a strategic tool not only to improve visitor experiences but also to mitigate the negative impacts off mass tourism, offering a replicable model for sustainable tourism development in culturally rich yet vulnerable regions.

Keywords: tourism, Artificial Intelligence, management of destinations, new model of tourism.

1. ARTIFICIAL INTELLIGENCE (AI) BETWEEN RESEARCH AND SOCIAL IMPACT

The subject of artificial intelligence (AI) is gaining increasing significance in research, particularly in the efficient management of related operational infrastructures. It drives the ongoing expansion and enhancement of a wide range of applications that are progressively impacting various facets of contemporary society¹. However, it is essential to recognize the environmental costs associated with energy-intensive IT infrastructures and the potential distortions that uncontrolled applications of these technologies could create in socioeconomic and sociopolitical spheres.

Notably, the ability to analyse multiple data points – enabled by the vast availability of large datasets (metadata) – aligns with advancements in technologies that promote the development of increasingly powerful electronic

¹ For the history of the evolution of AI, Boden, 2006.

machines (computers). Consequently, it is not surprising that the term “artificial intelligence,” coined seventy years ago by renowned Stanford University scientist John McCarthy (1959), refers to the scientific field focused on the engineering of intelligent machines.

The transition from theoretical research to the early implementation of AI programs in industrial settings spanned about forty years – from the 1950s to the early 1990s. During this period, the primary geoeconomic activity was centred in the United States, with Europe playing a limited role until significant intervention occurred with the launch of an innovative EU-funded research initiative (the Horizon Program).

The substantial development of “machine learning” emerged after 2010, when large U.S. multinationals, such as Google, Apple, Microsoft, and Amazon, invested significant financial resources in AI applications that quickly became integrated into key areas of society, including commercial, financial, and daily practices. The remarkable ease of operation and free access to platforms accessible to the public facilitated the mass adoption of “deep learning” and generative AI, which raised concerns over security issues, fraudulent profiling, and serious invasions into personal privacy, underscoring the need for specific regulations² (Fameli, 2025).

Regarding the relevance of this topic, the range of applications encompassing automation of business processes, predictive analysis, and governance of complex systems presents vast opportunities for development in the social sciences. Many startups are providing innovative services that make an immediate impact on various cultural activities. This widespread of generative AI platforms has required the sharing of initiatives and application models both in established settings and experimental projects.

As a result, especially after the pandemic, there has been a rise in detailed surveys and reports that document where AI methodologies have successfully enhanced project effectiveness across multiple human activities³. The sector most relevant to this research, for which extensive documentation exists, is tourism. The World Tourism Organization (WTO), in collaboration with Saxion University of Applied Sciences, recently released a comprehensive report highlighting the oppor-

tunities that AI offers for the efficient and profitable management of tourism activities (WTO-Saxion, 2025).

Furthermore, research in geography is highly focussed on the application of AI to tackle significant contemporary challenges in geoeconomic and geopolitical domains, as well as in the critical areas of environmental and social compatibility within territorial planning processes.⁴ Ultimately, there is a strong need to further investigate AI-centred methodologies in the geographical sciences, where the broad thematic scope allows research that can harness new opportunities for comprehensive documentation and timely information retrieval – capabilities that would be difficult, if not impossible, to achieve without AI techniques.

2. METHODS AND SOURCES

This study adopts an integrated methodological approach combining secondary statistical data and AI-enabled digital analytics to analyse assess and rebalance tourist flows. The research draws on OECD tourism benchmarks, ISTAT tourism flow distribution statistics, and congestion-management insights from IoT sensor analytics and platform-based user-profiling systems. AI techniques applied to tourism rebalancing include recommendation algorithms, predictive-flow analysis, and dynamic routing. The analysis focuses on a set of carrying capability indicators: spatial concentration of tourist stays, seasonality patterns, social pressure on local communities, and overtourism governance potential. The case study evaluation follows an explanatory-sequential logic, where AI digital outputs are interpreted in the light of sustainable destination-governance challenges to derive practitioner-oriented implications.

3. THE RAPID INCREASE IN TOURIST DEMAND AND THE RISK OF OVERTOURISM

The drastic decline in global tourism flows caused by the severe health crises of the Covid-19 pandemic has been fully absorbed, as indicated by the overall trends observed since the beginning of the 2023 season. Statis-

² In February 2025, the European regulatory mechanism for the civil use of AI (Reg. EU 1689 of 2024, known as the AI Act) came into effect.

³ Several reports are available that analyse both the areas in which AI can be advantageously employed and the types of platforms available for services offered by providers in the global market (Avasant, 2024). Particularly useful is the publication of a general report on AI (Stanford, 2025, 8th edition), the first edition of which was published by the Stanford Institute for Human-Centred Artificial Intelligence (HAI) in 2018.

⁴ Studies focused on AI applications that fall within the disciplinary realm of geoeconomic-geopolitical character are predominantly developed in Anglo-Saxon countries, but significant approaches from European scholars are also present. In general, analyses are oriented towards the search for new interpretative models of the interactions between geoeconomics and geopolitical factors that influence global structures and relationships. By way of examples, or due to their methodological significance, two recent studies are noted (Neacșu et al., 2025; Siqin Wang et al., 2024).

tical analyses reveal that many major touristic regions have completely recovered to pre-2019 levels (OECD, 2024; Bank of Italy, 2024). In Italy, preliminary data from Istat regarding hotel stays show that the numbers have surpassed those recorded in 2023. For the national tourism economy, this represents a complete recovery of pre-pandemic conditions, achieving a new record with over 450 million stays. Specifically, regarding the distribution of flows within the national tourism system, it is evident that in 2024, two-thirds of stays will concentrate in “cultural cities,” with particularly strong trends noted in Rome, Milan, Florence, and Bologna. Additionally, there is an exceptional growth in the city of Naples and the main tourist destinations in the Gulf, such as Sorrento, Capri, Ischia. This is part of a favourable overall performance in the southern region, with sustained demand for destinations in Puglia (Istat, 2025).

Essentially, the positive trend in tourist demand, as evidenced by global statistics, when linked to specific destinations known for their attractiveness, results in significant concentration phenomena. This creates a challenging balance both environmentally and in terms of negative externalities for local communities. Although discussions around hyper-tourism and the overcrowding of certain tourist destinations are not new, it is only in recent years that the phenomenon appears to have gained attention from public opinion and industry stakeholders⁵. This has led to a marked increase in studies focused on analysing the conditions related to a density of tourism, referred to as “overtourism” (Goessling et al., 2020; Mihalic, 2020).

This renewed interest, undoubtedly intensified by the exacerbation of the phenomenon due to the rising tourism pressure in the post-pandemic era, is also motivated by contemporary society’s emphasis on sustainability. This focus has been further amplified by recommendations from international organizations concerning potential strategies for mitigating environmental damage (Bimonte & Punzo, 2007).

In the 1970s and 1980s, most studies focussed on the high environmental costs associated with uncontrolled tourism growth in overcrowded areas, highlighting the concept of a carrying capacity – defined in 1981 as the optimal ratio between the number of individuals in a space and the available resources. However, the current debate goes beyond that logic, explicitly addressing

the impact that high tourist concentration has on local communities, leading, in extreme cases, to the expulsion of residents from historic centres and a progressive loss of identity in these places.

Moreover, from its earliest formulation, the concept of carrying capacity has revealed the limitations of relying solely on a quantitative indicator based on a “threshold value”, beyond which the load capacity of a given environment is no longer ensured. There is a need for a more qualitative approach that incorporates a dynamic perspective on how local communities can adapt to the inevitable pressures and develop suitable strategies for “carrying capability”. Therefore, an integrated and comprehensive approach is required, focussing on the ability of local institutions to manage these phenomena and the adaptability of the socioeconomic system to human pressures. The goal is to ensure sustainable tourism that not only preserves the identity of destinations but also benefits local communities (Prezioso, 2010).

On an epistemological level, to properly address the phenomenon of overtourism, it is essential not merely to assess visitor volume but also to prioritize the governance of this issue. Establishing a constructive balance between the tourist presence and the quality-of-life expectations of local communities is crucial. There is no universal metric to quantify when the pressure from tourist flows becomes excessive within a specific context. However, the resilience of the affected social system is undoubtedly linked to the environmental and economic factors altered by the pressure from tourist concentration. Moreover, it is notably shaped by the effective “rebalancing” initiatives implemented by local governance in managing the phenomenon. This line of reasoning illustrates why some destinations can successfully handle a high number of visitors, while others encounter adverse effects at significant levels of the presence of tourists.

In other instances, the causes may be more complex, including an existing infrastructure that is both inadequate and undersized to meet the needs of the local population, the school vacation calendar, and the growing influence of social media which highlights “Instagrammable” locations, leading to excessive human pressure. Additionally, poorly managed urban development can exacerbate these issues. Often, these factors are interconnected, triggering a negative feedback loop that intensifies public perception of the situation⁶.

⁵ The need for proper calibration between environmental endowment and the utilization of related resources emerged as early as the 1960s, when, at the initiative of the Cassa per le Opere Straordinarie nel Mezzogiorno (CasMez), specific studies were undertaken to measure the “temporary” human carrying capacity of certain territorial areas, with particular attention to the coast and the use of beach resources. Andriello, 1964.

⁶ The difficult determination of a unifying paradigm capable of identifying “crisis” situations and proposing appropriate “solutions” explains the proliferation of specific research focused on “case studies” present in the literature. There is a notable presence of research referring to historically significant art cities with established attraction. In this regard, studies related to the cases of Venice (Bertocchi, 2022) and Dubrovnik (Camatti, 2020) appear particularly interesting.

What is clear, however, is that unmanaged overcrowding is unsustainable in the long term for any city or region. While overcrowding can lead to significant economic and social costs, it is essential to assess how these costs compare to the benefits generated by tourism. Furthermore, it is important to consider whether tourism revenues can be more effectively leveraged to mitigate the costs and ultimately enhance the quality of life for residents.

Conversely, effectively addressing and managing the phenomenon of overtourism requires coordinated efforts from both public and private stakeholders. It is to ensure that the growth of tourism enhances rather than deteriorates the socioeconomic fabric and ecosystem of the destinations. This fabric, or the uniqueness of a place, often serves as a primary form, particularly in today's era of globalization. Consequently, overcrowding poses a threat not only to local residents and businesses but also reduces the overall attractiveness of the destination. This situation underscores the critical need for a collaborative approach grounded in concrete data.

Such considerations bring us to the need for a multidimensional and multidisciplinary approach that, with the support of suitable generative AI techniques, can provide a comprehensive and precise identification of the various components that define the complexity of the phenomenon under study.

All stakeholders in the sector – policymakers, communities, and the tourists themselves – must be engaged in a participatory process aimed at adopting practices and guiding principles for a more resilient future tourism. This involves redefining the concept of sustainability in tourism as a democratic principle, where the interests of residents align with the needs of temporary visitors drawn to the uniqueness of the destination in pursuit of their emotional expectations. Ultimately, this requires promoting tourist accommodation consistent with a new integrated vision that addresses the evolving needs of the contemporary tourism system (Perkumiene, 2019).

4. OVERTOURISM AND ARTIFICIAL INTELLIGENCE: NEW PERSPECTIVES FOR SUSTAINABLE DESTINATION MANAGEMENT

The rapid acceleration of Artificial Intelligence (AI) technologies, particularly in recent years, has significantly impacted the tourism sector. This development has established a pivotal role for AI not only among large companies within the industry but also for countless small businesses operated by independent entrepreneurs. The integration of artificial intelligence into this field has fostered an environment where digital innova-

tion such as blockchain, cyberspace, and the Internet of Things (IoT) are widely applied. These technologies have streamlined operations and enhanced decision-making processes, leading to a gradual transformation in customer service. This transformation facilitates the swift and straightforward distribution of information about destinations, transport options, accommodation, cultural attractions and opportunities for interactions between cultural expectations and leisure activities. As a result, operators can quickly adapt their offerings to meet emerging demands, promptly providing travel options tailored to experiential content, incorporating clear qualitative elements to help potential customers assess the cost-benefit ratio of various options.

On a broader scale, for users with linguistic barriers, widely accessible applications available on social networks now offer a comprehensive language support. These applications personalize itineraries based on selected routes and provide access to descriptive content tailored on geolocation, alongside a wealth of detailed information on local customs, culinary traditions, behavioural norms, and other factors that can enhance the overall travel experience (Aru, 2022).

However, it is primarily in the business realm that contemporary AI platforms demonstrate the most significant impacts in terms of development and system efficiency. Through their computational capabilities and the access to vast amounts of data via powerful digital infrastructures, these platforms have driven notable evolution in business models focused on efficiency and the optimization of management strategies, significantly influencing revenue (Pellegrini, 2024; Miotto, 2018). Tour operators and hospitality businesses are increasingly leveraging these tools for predictive analyses that optimize pricing strategies, improve transportation planning and itinerary design, and identify optimal partnerships with local complementary businesses. This creates more attractive integrated tourism packages, both in terms of price and quality of included services.

Nevertheless, like any transformative technology, the integration of AI in the tourism sector presents a range of complex challenges alongside its opportunities and widespread advantages. While it enables greater efficiency, personalization, and innovative experiences, it also raises significant concerns regarding privacy protection. This is particularly true when it comes to profiling sensitive personal data or implementing behaviour patterns that may not always align with the human dimension, which is fundamental to maintaining customer loyalty (Baggio, 2019; Floridi, 2013).

Furthermore, the real effect of the widespread adoption of AI platforms on the obsolescence of traditional

job functions within the industry remains uncertain, making it challenging to assess from theoretical perspectives. This uncertainty affects ongoing processes and the demand for innovative skills that are not available in the labour market. These issues are crucial but lack clear definition or consensus, despite the recognition of their social implications.

While the interplay of positive and negative aspects continues to shape the search for a nuanced understanding of the scenarios that the new frontier of AI in tourism will ultimately project onto the overall economy of the sector, there is no doubt that AI assistance represents a fundamental approach for finding appropriate solutions to fight the phenomenon of overtourism, especially in light of the geographical risks involved.

From this perspective, addressing this specific challenge, the WTTC and McKinsey & Company (2017) suggest an integrated approach that, rather than resorting solely drastic measures for controlling flow, focuses on progressive adaptation strategies for the territorial system through targeted investments. In other words, it is essential for destination management to not only implement strategic tools for sustainable growth in the face of tourist overcrowding but also to engage all stakeholders – local communities, public institutions, and regional operators – in the efforts to mitigate or prevent overtourism.

To achieve this, it is crucial to pinpoint the root causes of appropriate investments in infrastructure and environmental protection measures while also securing the financial resources. This can be accomplished through the use of research tools supported by efficient AI platforms, capable of cross-referencing multiple data sources and processing large volumes of information to build an appropriate database for monitoring and optimizing the distribution of visitor flows and suggesting alternative planning solutions for specific tourist areas. This approach makes it easier to identify the root causes of overcrowding and coordinate targeted interven-

tions that can progressively reduce the environmental risk level and mitigate the likelihood of social conflict, without necessarily abandoning growth-focused policies. Implementing reliable monitoring systems and early warning mechanisms remains an ambitious goal that is facilitated using new AI technologies, fostering enhanced collaboration among all stakeholders in the local tourism economy, safeguarding the environment, and ensuring satisfactory living conditions for the local population unaffected by tourism income redistribution.

To attain these positive outcomes, a collective agreement on relevant economic, social, and environmental indicators is essential. This process can be accomplished with the help of AI tools designed to identify and analyse connections, joint effects, and functional interactions among various factors operating over time and within specific geographical spaces.

Investing in the development of intelligent data collection systems and digital platforms to manage visitor flows – similar to initiatives already implemented in Florence – where IoT technology has been used to monitor and control tourist flows and Venice which employers’ sensors, cameras, and mobile signals monitored from a control centre to manage congestion and improve visitor experience – is no longer an option to be deferred. The related infrastructure must now necessarily incorporate innovative AI tools.

AI technologies, such as predictive analytics and machine learning, serve as a strategic instrument for addressing overtourism. They can forecast tourist flows, including their volume and peak visitation time, allowing for more efficient allocation of resources. Additionally, they provide valuable recommendations to users about alternative routes and timing for visiting attractions, which aids in dispersing crowds and to reducing congestion (Shafee, 2024). Furthermore, services based on “dynamic pricing” logic, facilitated by AI-driven applications, can encourage off-season tourism, benefiting both the overall economy of the industry and promoting a

Table 1. Core AI applications for sustainable and balanced tourism.

AI Application	Function in Tourism	Practitioner Benefit	Overtourism Mitigation Outcome
Recommendation Systems	Personalised suggestions for lesser-known destinations	Improves visitor experience	Spatial dispersion of tourist flows
Predictive Analytics	Forecasting visitor volumes and peak times	Optimises staffing and pricing	Anticipation of congestion risks
Dynamic Routing	Real-time adaptive itinerary and path suggestions	Enhances journey efficiency	Reduction of crowding at hotspots
AI-based Storytelling	Data-driven narrative content tailored by interests	Higher cultural engagement	Promotion of peripheral/rural sites

more balanced use of tourism resources. With improved visitors' distribution, intelligent systems for waste and resource management can help minimize environmental impact to levels compatible with existing territorial considerations, supported by the interactions inherent in the blockchain model utilized in the monitoring process.

However, the strategies suggested by AI can only yield positive outcomes if they are implemented alongside intelligent and sustainable practices in a context characterized by continuous collaboration among governments, local communities, and industry stakeholders, all in alignment with sustainable development goals.

5. THE "UNEXPECTED ITALY" CASE

In the context of new AI technologies and their broader implication for tourism – where entrepreneurial interests, social expectations, and environmental sustainability intersect – it is pertinent to discuss a practical application: the Unexpected Italy app. Launched in 2024 by two young innovators, Elisabetta Faggiana and Savio Losito, this cutting-edge mobile application aims to enrich the tourist experience in Italy tourism by a holistic view of the country's diverse offerings. This app seeks to shift focus from well-known tourist attractions to highlight less-known realities, redefining how users experience Italy's rich landscape. Designed to address the challenge of overtourism, it promotes a travel model that directs users toward less famous yet culturally, historically and geologically significant destinations. This not only enhances the appreciation of Italy's national heritage but also fosters a sense of territorial authenticity. Unexpected Italy provides users with engaging content and travel orientations that are framed within specific experiential offerings. It encourages exploration from a fresh and unconventional perspective, guiding travellers towards unique sites, local traditions, cultural events, and intriguing experiences that unveil unexplored customs and lifestyles. In doing so, the app plays a vital role in promoting small villages and rural areas at risk of depopulation, thereby contributing to their revitalization.

By embracing this innovative approach, Unexpected Italy platform enhances the overall travel experience and supports sustainable tourism practices, ultimately benefiting visitors and local communities alike.

From an operational standpoint, Unexpected Italy utilizes a profiling system based on users' personal interests and preferences to create tailored itineraries. It suggests routes and activities while offering users the opportunity to connect with local guides. This setup not only provides travel advice but also shares stories and

fascinating insights about various Italian regions, along with practical information to enhance vacation planning. The model is driven by the aim to cultivate a participatory and mindful tourism experience, encouraging interaction between travellers and local communities to promote cultural exchange and support local economies. It operates on the belief that tourists should not simply consume destinations but actively engage with the host communities to uncover their authentic identities.

Upon starting, users select a traveller profile that best represents them from a range of options. Based on this choice, the app proposes personalized itineraries that include both iconic landmarks and recommendations for accommodations and services along the way. Additionally, the app features an interactive map covering fourteen Italian destinations, such as Milan, Matera, Venice, Rome, Modena, and the Valle d'Itria. Each destination is presented through narrative sheets that blend practical details with experiential insights, enriching the user experience.

Another noteworthy feature of the Unexpected Italy app is the rigorous selection process for local partners, who must meet criteria centred around authenticity and environmental sustainability, as well as maintain independent management to be included on the platform. This approach facilitates direct relationships between visitors and host communities, by allowing users to contact local operators directly, thus eliminating intermediaries and commissions. As a result, the app promotes a fairer and more transparent economy while supporting local artisans and small businesses.

From a technological point of view, Unexpected Italy operates on a model where basic functionalities are available for free, while advanced features – such as in-depth thematic itineraries and detailed digital guides – are offered through a paid subscription.

The description clearly illustrates how initiatives like Unexpected Italy are pivotal in fostering more sustainable and responsible tourism practices. Moreover, this digital tool promotes not only alternative models of tourism consumption but also advances a cultural and social vision of tourism that emphasizes mutual understanding, environmental respect, and regional development.

This approach helps alleviate the pressure on more popular destinations while enabling local communities to reap the economic benefits of tourism in a more equitable manner. Such a methodology not only enhances the tourism experience but also contributes to the preservation and enhancement of the cultural and natural heritage of the areas visited. Initiatives like Unexpected Italy play a crucial role in raising traveller awareness about the significance of sustainable tourism

and encouraging responsible travel practices. By diversifying tourism offerings and shining a light on lesser-known locations, substantial strides can be made in managing overtourism and protecting tourist destinations for the future.

The case of Unexpected Italy clearly illustrates how technological innovation can serve as a powerful tool in promoting experiential and sustainable tourism, rooted in social responsibility and cultural sensitivity among travellers. Specifically, this platform aims not only to reshape the landscape of Italian tourism but also to encourage a wider dialogue about the relationship between tourists, the territory, and local communities in today’s digital age.

6. CONCLUSIONS

The intersection of AI and tourism opens new opportunities for balanced destination management in vulnerable yet culturally rich regions. The Unexpected Italy case remains a promising example, but to advance academic value, tourism-flow evidence and AI-driven governance indicators need to be clearly systematised. AI does not merely enhance personalisation for visitors – it becomes a strategic territorial-rebalancing tool when embedded in collaborative destination-governance ecosystems. This approach contributes to the ongoing sustainable-tourism debate and offers replicable practitioner implications for overtourism mitigation grounded in AI-enabled spatial awareness and place authenticity.

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